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basic imagery interpretation report

Activity and Developments at Selected Soviet Space-Related Research Development, and Production Installations (S)

STRATEGIC WEAPONS INDUSTRIAL FACILITIES
BE: Various
USSR

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INSTALLATION OR ACTIVITY NAME					COUNTRY
Activity and Developments at Selected Soviet Space-Related Research, Development and Production Installations					UR
UTM COORDINATES	GEOGRAPHIC COORDINATES	CATEGORY	BE NO.	COMIREX NO.	NIETB NO.
NA	See below	See below	See below	See below	See below

MAP REFERENCE

ACIC. USATC; Series 200; Sheets 0154-23, 0156-13, 0165-17, and 0167-5; scale 1:200,000

LATEST IMAGERY USED	NEGATION DATE (If required)
See "Introduction"	NA

Installation Name	Geographic Coordinates	Category	BE No	COMIREX No	NIETB (MRN) No
Zagorsk Rocket Engine Test Facility Krasnozavodsk	56-25-44N 038-10-49E	[redacted]			
Nizhnyaya Salda Rocket Engine Test Facility	58-09-30N 060-56-02E				
Kurumoch Rocket Engine Test Facility	53-32-15N 049-51-16E				
Moskva Missile & Space Propulsion Dev Center Khimki 456	55-54-20N 037-26-51E				
Faustovo Aerospace Rsch & Dev Facility	55-27-28N 038-31-32E				
Faustovo Aerospace Rsch & Dev Test Range/Track	55-29-07N 038-29-45E				
Kuybyshev Aerospace Production Plant 1	53-13-12N 050-17-59E				
Moskva Missile Production Plant Fili 23	55-45-30N 037-29-28E				
Moskva Missile & Space Dev Center Kaliningrad 88	55-55-17N 037-48-05E				
Moskva GM Rsch & Dev Plant Khimki 301	55-53-50N 037-25-56E				
Zagorsk Missile & Space Dev Center	56-27-08N 038-04-35E				

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ABSTRACT

1. (S) This report describes recent developments at 11 Soviet space-related research, development, and production facilities and updates NPIC report, [redacted] This report contains a location map, 40 annotated photographs, and 19 tables. The information cutoff date is [redacted] 25X1 25X1

2. (TSR) A major expansion of space exploitation capabilities is underway in the Soviet Union. This expansion of capabilities is being accomplished through the development of new space launch vehicles, high-energy propulsion systems, and new spacecraft. Much of the evidence for these new systems was derived from imagery and includes the construction of new facilities that will be used to develop, produce, test, and operate the systems.

3. (TSR) A high-volume, possible liquid hydrogen production plant is under construction at Zagorsk Rocket Engine Test Facility (RETF) Krasnozavodsk. A large, cryogenic, hydrogen/oxygen rocket engine test stand, possibly for the developmental testing of an engine using hydrogen slush, will soon be operational at Nizhnyaya Salda RETF. The capacity of Kurumoch RETF to test liquid hydrogen propulsion systems was being expanded, while the acceptance testing of engines for more conventional, operational systems continued at a high rate. Rocket engine nozzles of two different sizes have been identified at Kurumoch RETF. A large, high toxicity propulsion test facility was nearly complete at Moskva Missile and Space Propulsion Development Center Khimki 456. A smaller, probable high toxicity propulsion test facility has probably attained operational status at Faustovo Aerospace Research and Development Facility. Preparations for the production of a large, new space launch vehicle were underway at Kuybyshev Aerospace Production Plant 1. Kuybyshev Plant 1 was also producing a large, cryogenic propellant-storage tank and might be involved in a program to upgrade the SS-N-12 missile. Production capacity for the SL-12/-13 missiles has been significantly increased at Moskva Missile Production Plant Fili 23. Significant new construction at Moskva Missile and Space Development Center Kaliningrad 88 will increase the center's capacity to develop and/or produce a variety of space-related systems, including new launch vehicles, propulsion systems, and spacecraft. At Moskva Guided Missile Research and Development Plant Khimki 301, a major program to increase the plant's capacity to develop and to produce unmanned spacecraft is underway. A new suspect developmental test facility was in a very early stage of construction at Zagorsk Missile and Space Development Center. The new construction and modifications of space launch complexes and support facilities at Tyuratam Missile/Space Test Center were related to at least some of these developments.

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INTRODUCTION

4. (TSR) The 11 installations (Figure 1) discussed in this report comprise a major portion of the Soviet space hardware industry. They include facilities which are involved in the research, design, development, production, and testing of Soviet space launch vehicles (SLVs), propulsion systems, and manned and unmanned spacecraft. An understanding of the activities and developments occurring at these installations is crucial to a prediction of future Soviet space efforts.

5. (TSR) The current reporting period for each of these installations is different, depending upon the date of the latest imagery used in the last NPIC basic report.[1] All applicable imagery between the earliest of those dates, [redacted] was used in the preparation of this report. The specific reporting dates for each installation are listed below.

Installation	Reporting Period
Zagorsk RETF	[redacted]
Nizhnyaya Salda RETF	
Kurumoch RETF	
Moskva Khimki 456	
Faustovo R&D Facility	
Faustovo Test Track	
Kuybyshev Plant 1	
Moskva Fili 23	
Kaliningrad 88	
Moskva Khimki 301	
Zagorsk Missile & Space Center	

This is not a complete list of facilities involved in the Soviet space industry. The following facilities are of considerable additional interest but are reported elsewhere: Dnepropetrovsk Missile Development and Production Center [redacted] 25X1
Omsk Airframe Plant 166 [redacted] Omsk 25X1
Rocket Engine Test Facility Gornaya Bitiya (BE [redacted], Dodonovo Missiles and Space Com- 25X1
ponents Plant [redacted] and several space 25X1
research institutes.[2-4]

Conclusions Regarding Future Soviet Space Programs

6. (TSR) The Soviet Union is in the process of significantly expanding its space exploitation capabilities. A number of new programs now 25X1
underway will greatly increase that country's abil- 25X1
ity to more efficiently launch a wide variety of heavier space payloads. These programs can be grouped into three broad categories: the development of new SLVs, propulsion systems, and space-
craft. In addition, the production of most opera- 25X1
tional systems probably continues unabated. Much of the information about these programs is derived from imagery.

7. (TSR) The Soviets have at least two new SLVs in development. This is indicated by major differences in the two new space launch complexes under construction at Tyuratam Missile/Space Test Center SSM [redacted] A large, new 25X1
heavy-lift SLV will probably be launched from Tyuratam Space Launch Site W [redacted] 25X1

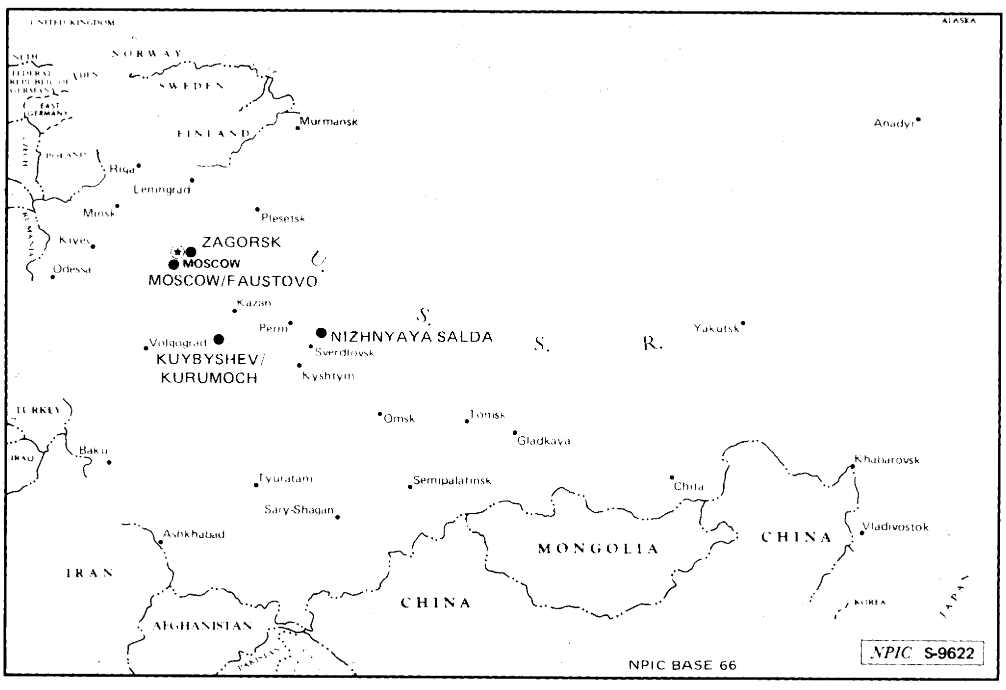

FIGURE 1. LOCATIONS OF SELECTED SOVIET SPACE-RELATED RESEARCH, DEVELOPMENT, AND PRODUCTION INSTALLATIONS

This vehicle is expected to have a payload capacity significantly greater than the SL-12, the Soviet's largest operational SLV. A smaller SLV is probably being developed for use at Tyuratam Launch Site Y [redacted]. In addition, Tyuratam Space Launch Site J1/2 [redacted] the launch area for the TT-05 heavy-lift vehicle, is being modified to accommodate a new SLV (probably the same vehicle, or another version of the vehicle that will be launched from site W).

8. (TSR) Additional evidence for the development of a new heavy-lift SLV has been identified at Zagorsk RETF, Nizhnyaya Salda RETF, and Kuybyshev Plant 1. At Zagorsk RETF, the construction of a large, new possible liquid hydrogen production plant is certainly related to the development of one or more new SLVs. Its large size, its location at Zagorsk RETF, the time of its construction, and the identification of a specialized cryogenic propellant-storage tank—identical to those being installed at the new Tyuratam space launch complexes—clearly indicate that the new Zagorsk installation is heavily involved in the development of at least one new SLV, even if the production of liquid hydrogen is only part of its function. At Nizhnyaya Salda RETF, the construction of a large vertical rocket engine test stand is nearly complete. This test stand was apparently built to test engines for a large new SLV. At Kuybyshev Plant 1, assembly floorspace is being expanded to accommodate the production of the new heavy-lift SLV. The new assembly hall will be attached to the building that was previously involved in the production of the now abandoned TT-05.

9. (TSR) The activities at these installations strongly indicate that the Soviets have committed vast resources to the development and production of at least two new SLVs, including one in or near the TT-05/Saturn-5 size class.

10. (TSR) The Soviets are developing several new, high-energy, space-related propulsion systems. Major efforts are underway on at least two separate propellant families—cryogenic and high toxicity propellants. In addition, large solid-propellant strap-on boosters and toxic cryogens are possibly being developed for space applications.

11. (TSR) The new SLVs now in development will probably use cryogenic hydrogen and oxygen in at least some of their stages. An upper-stage liquid hydrogen/liquid oxygen (LH_2/LOX) engine may already have been developed at Zagorsk RETF, where a liquid hydrogen production plant and a developmental static test facility for small hydrogen engines have been operational since about 1971. A series production acceptance test program for that engine may soon begin at either Zagorsk or Kurumoch RETF. Kurumoch RETF has probably been involved in liquid hydrogen engine work for several years. It is unclear, however, whether this activity is related to LH_2/LOX engine development at Zagorsk RETF or the testing of another upper-stage LH_2/LOX engine. The new rocket engine test stand at Nizhnyaya Salda RETF will be operational in 1981. It will be used to developmentally test the Soviet's first large, cryogenic hydrogen/oxygen rocket engine. This engine may use hydrogen slush fuel and may be ready for use on the new Soviet heavy-lift vehicle by 1983 or 1984.

12. (TSR) There is ample evidence that the Soviets are also continuing to pursue the development of high-energy propulsion systems using highly toxic liquid propellants. A large, new, high toxicity exhaust gas scrubber was nearly complete 25X1
at Moskva Khimki 456. The scrubber has been 25X1
connected to test stand 1 and may achieve an operational capability in 1980. Moskva Khimki 456 may be developing engines using propellants that are not only highly toxic but cryogenic as well. New probable high toxicity propulsion test facilities may already be operational at Faustovo Aerospace Research and Development Facility. The new horizontal test building and all support facilities—including multiple toxic gas control systems—were complete in 1978, but evidence of engine testing has yet to be identified.

13. (TSR) The Soviets may also be planning to use advanced solid propellants to obtain high thrust to weight ratios in the boosters of one or more of their new SLVs. A large, new, segmented motor that is being extensively tested at Biysk Solid Motor Test Area II [redacted] may be 25X1
designed as a strap-on booster (similar to those used on the US Titan III-C SLV) for one of the new Soviet SLVs. The segmented motor is [redacted] 25X1
meters long by [redacted] in diameter. It is com- 25X1
posed of two motor segments, each [redacted] long 25X1
by [redacted] in diameter. 25X1

14. (TSR) Soviet resources devoted to the development and production of both manned and unmanned spacecraft are being significantly expanded. This is evidenced by major construction programs at two facilities reported here: Moskva Missile and Space Development Center Kaliningrad 88 and Moskva Guided Missile Research and Development Plant Khimki 301; and by similar activity at several Soviet space research institutes reported elsewhere.[4] Much of the new construction at Moskva Kaliningrad 88 is probably intended to support manned and unmanned spacecraft development. At Moskva Khimki 301, major expansion of the plant will significantly increase Soviet unmanned spacecraft development and production capabilities.

15. (TSR) While there is considerable evidence for the development of new space systems, the production of currently operational systems apparently continues undiminished. Recent relocation of SL-12/-13 production within Moskva Missile Production Plant Fili 23 probably indicates a Soviet intention to increase production of those systems. SL-12/-13 production was apparently transferred to a much larger assembly building in 1978. In addition, the capacity to prepare these SLVs for launch is being significantly increased by the construction of a large, new, SL-12/-13 vehicle assembly and checkout building at Tyuratam ICBM Test Support Facility 7 ([redacted] 25X1

16. (TSR) The high level of activity (particularly the presence of large numbers of shipping containers and railcars) at Kuybyshev Plant 1 indicates that the production of other SLVs is continuing at a high rate. The apparently high level of SLV engine acceptance testing at Kurumoch RETF also continues unabated. Kurumoch RETF is the most active Soviet series production acceptance test facility for SLV rocket engines. This is

partly due to its responsibility for testing engines used in the SS-6-based SLVs (SL-3, SL-4, and SL-6) produced at Kuybyshev Plant 1. At least four Kurumoch test positions were actively involved in engine test programs during the current reporting period.

Zagorsk Rocket Engine Test Facility Krasnozavodsk

17. (TSR) A new, high-volume, possible liquid hydrogen production plant (Figure 2) was in a late stage of construction 1 nautical mile (nm) west of the Zagorsk RETF central test area. The function of the new installation has been unidentified since initial construction was observed in September 1972. Alternate hypotheses about the function of the installation have included the following:

a. Assembly/checkout of large space boosters,

b. Structural testing of SLVs, or

c. Environmental testing of large space payloads

Although none of these postulated functions have been disproven, as the installation approaches completion, analysis of numerous features and activities has led to its identification as a possible liquid hydrogen production plant. In fact, the installation may have multiple functions, including the production of liquid hydrogen.

18. (TSR) Compared to the liquid hydrogen production plant at the central test area of Zagorsk RETF (Figure 3) and other suspected Soviet industrial-scale liquid hydrogen production plants using electrolysis, the new plant at Zagorsk has all of the essential features that would be expected at its present stage of construction. The major difference is that this plant will have a much higher production capacity than any preexisting Soviet hydrogen plant.

Table 1.
Buildings and Structures at the Possible Liquid Hydrogen Production Plant Zagorsk RETF (Items keyed to Figure 2)
This table in its entirety is classified TOP SECRET RUFF

Item	Prob Function	Dimensions (m) L	W	H	Floorspace (sq m)	First Seen Ucon	Complete	Comments
1	Support bldg	23	13	4	299			
2	Admin/support bldg	54	13	10	702			
3	Electrical control bldg	35	17	5	595			
4	Support bldg	12	6	3	72			
5	Admin/engr bldg	72	16	8	1,152			
6	Support bldg	44	38	12	(1,672)			Incomplete
7	Poss LH_2 production bldg	—	—	—	(50,431)			Incomplete
a	High-bay sect	110	56	77	6,160			
b	High-bay sect	110	60	59	6,600			
c	High-bay sect	120	107	45	10,323			
d	Poss rectifier sect	48	37	37	1,776			
e	Poss electrolysis sect	83	48	16	3,984			
f	Poss shop/maint sect	109	48	16	5,232			
g	Utility sect	260	13	28	3,644			
h	Admin/engr sect	227	8	24	12,712			7 stories (approx)
j	Admin sect	76	15	—	(1,140)			Incomplete
k	Support sect	73	16	6	(1,168)			Incomplete
8	Support bldg	23	13	4	299			
9	Unid bldg	60	18	6	1,080			
10	Unid bldg	—	—	—				
11	Gas holder	—	diam		(15,705 cu m)			Vol
12	Foundation	—	14 diam	—				
13	Foundation	—	14 diam	—				
14	Pumphouse	89	13	9	1,157			
15	Support bldg	21	7	6	147			
16	Cooling tower	48	12	11	—			Induced draft, 3 cell
17	Excavation	—	—	—	—			Incomplete
18	Shipping/receiving bldg	240	35	6	(8,400)			Incomplete
19	High-pressure gas stor	—	—	—	—			No usable floorspace
20	High-pressure gas stor	—	—	—	—			Not under roof, incomplete
21	Pumphouse	37	13	5	481			
22	Water reservoir	24	18	4	(1,728 cu m)			Vol
23	Water reservoir	24	18	4	(1,728 cu m)			Vol
	Total completed floorspace				56,415			

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19. (TSR) The main feature of the installation is a large, U-shaped, possible hydrogen production building (item 7, Figure 2 and Table 1) consisting of seven main sections and several minor sections. A linear administration/engineering section (item 7h) connects three large high-bay sections on the east to three additional sections (one high bay and two low bays) on the west. Substantial amounts of ventilation equipment were being installed on all production sections of the building by the end of the reporting period.

20. (TSR) The west wing of the possible hydrogen production building includes possible rectifier, electrolysis, and shop/maintenance sections (items 7d through 7f). The high-bay, possible rectifier section is similar to other rectifier buildings used in the Soviet chemical industry and is close to a large power substation. The possible electrolysis section has a system of gas manifolds along two of its sides. The manifold system has the capability of venting gas to the atmosphere, if necessary, but is apparently part of a hydrogen collection system. This system directs hydrogen gas into a [redacted] supply line that leads from the possible electrolysis section to a building (item 9) between the east and west wings of the main production building. Another gas supply line leads from the possible electrolysis section to a large gas holder (item 11). The design of the manifold system indicates that the section contains numerous banks of small possible electrolysis cells. A possible shop/maintenance section is adjacent to the possible electrolysis section and probably serves the entire building.

21. (TSR) The east wing of the building includes the three high-bay sections (items 7a through 7c) that are apparently involved in the purification, compression, and liquefaction of hydrogen and perhaps oxygen. The specific functions of the individual sections have not been identified, and it is possible that additional activities are also occurring there.

22. (TSR) In addition to the large production building, the new possible liquid hydrogen plant already contains the following facilities essential to the production of liquid hydrogen from water:

a. Two large bunkered reservoirs (items 22 and 23) to store water for electrolysis and cooling,

b. A very large electrical control substation to provide power for electrolysis and compression,

c. A large gas holder (item 11) for surge storage,

d. A large induced draft cooling facility for heat exchange during compression,

e. Large spherical and cylindrical tanks to store cryogenic liquids,

f. Two banks of high-pressure gas bottles (items 19 and 20) to pressurize or purge lines, and

g. Multiple rail spurs for the loading and transportation of cryogens.

It is too early for the identification of flare stacks, cryogen loading points, lightning arresters, or cryogen railcars.

23. (TSR) The water storage facility contains a pumphouse (item 21) and two reservoirs with a combined storage capacity of approximately 3,500 cubic meters. The electrical substation is significantly larger than the substation dedicated to the original hydrogen production plant at the central test area of Zagorsk RETF. The gas holder has a storage capacity of approximately 16,000 cubic meters. There may be plans to construct additional gas holders. Two 13-meter-diameter circular foundations, possibly for smaller gas holders, are adjacent to the large gas holder. The cooling facility contains a three-cell induced draft cooling tower (item 16), a large pumphouse (item 14), and a support building. The size of the pumphouse indicates that additional cooling towers may eventually be constructed. By [redacted] in fact, an excavation for another possible cooling tower was identified (Figure 4). 25X1

24. (TSR) Both spherical and cylindrical cryogen storage tanks were being installed at the new plant. The spherical tank (Figure 5) is an insulated, dual-walled cryogen tank with an outer diameter of [redacted] an inner diameter of [redacted] and a storage capacity of about 1,400 cubic meters. It is being installed between the two wings of the production building. This tank is identical to at least 22 cryogenic propellant-storage tanks under construction at Tyuratam Space Launch Complexes J, W, and Y.[5] These tanks will probably store cryogenic hydrogen and oxygen for the two new SLVs expected to be launched from these sites. The tanks are supported on eight legs mounted on specially prepared and distinctively patterned bases. First, the inner-tank wall is assembled upon the supporting legs from pre-assembled gore sections. Then an outer-tank hemispherical wall is assembled on the ground. The inner-tank wall is lifted from its supports, and the hemisphere is inverted and placed upon the eight supporting legs, becoming the bottom half of the outer-tank wall. After replacing the inner-tank wall, the top half of the outer-tank wall is welded in place one section at a time. The [redacted] space between the two walls of the completed tank (Figure 6) is probably evacuated of air and filled with a high efficiency insulating material that gives physical support to the inner wall without excessive heat conduction from the outer wall. 25X1 25X1 25X1 25X1

25. (TSR) Cylindrical tanks of two different sizes were also being installed at the possible hydrogen production plant. The larger tank could be used to store either liquid hydrogen or liquid oxygen and probably other cryogens as well. It is [redacted] in diameter by about 33 meters long (external dimensions), giving it a storage capacity probably no greater than about 240 cubic meters (perhaps as low as 200 cubic meters), assuming an insulating wall thickness of at least [redacted] A description and a drawing of the 33-meter tank were given in a recent Soviet publication, "Cosmodrome."[6] This document was helpful in confirming the cryogenic function of the tank. It showed that the overall length of the tank is [redacted] The imagery-derived length of [redacted] does not include the tank's end domes and fittings. The tank 25X1 25X1 25X1 25X1

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is ribbed and has four inline fueling/venting ports near its center (Figure 7). Only one 33-meter tank has been delivered to the new Zagorsk possible hydrogen production plant, but there are indications that nine of these tanks might eventually be installed there. The tank was being produced at Kuybyshev Aerospace Production Plant 1, where seven were ready for transshipment, when the plant was last seen on [redacted] Identical tanks have also been identified at the Nizhnyaya Salda and Omsk RETFs, but there were no indications that additional tanks will be shipped to those facilities in the near future.

26. (TSR) The first 33-meter cryogen storage tank had arrived at Zagorsk RETF by [redacted] when it was observed on a rail line at the possible hydrogen production plant (Figure 8). Between [redacted] the tank was moved to the foot of one of the high-bay sections of the east wing of the production building. Then, between [redacted] the tank was hoisted to the roof of that section, 77 meters above the ground (Figure 9). This operation was apparently conducted to prove the feasibility of lifting the tank to the roof of the building— since the surfacing and weatherproofing of the roof were incomplete at the time—and the tank and hoisting device were returned to the ground shortly thereafter. A mounting rack that was also temporarily positioned on the roof of the building appeared (from its design and configuration) to be capable of supporting nine of the 33-meter horizontal tanks. The feasibility test was apparently successful. The mounting rack and hoist will probably return to the roof when the building is complete, and additional tanks have been delivered to the installation. By [redacted] pipelines were already being installed on the roof of the building (Figure 4).

27. (TSR) Two smaller, cylindrical propellant-storage tanks, each [redacted] in diameter, were also observed at the plant. Like the 33-meter tanks, these are heavily ribbed, but no cryogenic association has been confirmed.

28. (TSR) The two banks of vertical, high-pressure gas storage bottles were on the east side of the plant adjacent to a rail spur. Installation of the gas bottles and a gallery of high-pressure gas lines, leading to the area of spherical tank construction and horizontal tank storage, was incomplete.

29. (TSR) Although the three rail spurs under construction appeared to serve one of the high-bay sections of the production building, only one of the spurs is expected to enter the building. Imagery of the building under construction (Figure 10) shows that the projected entrance for two of the spurs (east and west) is blocked by structural members (item A) or exterior wall sections (item B). Although the center rail spur may enter the building through a door, its passage into the building is soon blocked by an interior wall (item C). No other sections or sides of the building can be directly served by rail. This lack of rail service to the interior of the building significantly reduces the probability of an assembly/checkout function or structural/environmental test function for the building. The immense height of the building has

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not been satisfactorily explained, however. Consequently, these alternate hypotheses cannot be ruled out at this time.

30. (TSR) If the two new SLVs currently in development use cryogenic hydrogen in one or more of their stages, there will be a great increase in the Soviet missile industry's demand for liquid hydrogen. Large quantities of liquid hydrogen will be needed during engine development, vehicle flight testing, series engine testing, and operational use. The role of the large, new Zagorsk possible hydrogen production plant will be to make up the difference between the output of current liquid hydrogen producers and total projected hydrogen consumption.

31. (TSR) Although most of the Zagorsk RETF construction during the past two years has occurred at the possible hydrogen production plant, a significant amount of new construction has also been observed at the central test area. This activity (Figure 11 and Table 2) includes the reconstruction of propellant facilities at test stand 3, the construction of additional waste treatment facilities (items 4 through 8) below test stands 2 and 3, and tree clearing and earth grading for significant new construction between test stands 2 and 3.

32. (TSR) The propellant-related construction includes the reconstruction of a propellant-storage building (item 11) and the construction of several new buildings (items 9, 10, and 12). A [redacted] propellant-storage tank, identical to two seen at the new possible hydrogen production plant, was being installed in the reconstructed building. An identical [redacted] tank and two [redacted] cylindrical tanks have been delivered to the assembly/checkout building associated with test stand 1. Their location near test stand 1 is probably not an indication of their final destination.

33. (TSR) A significant new construction program was indicated by tree removal and earth grading in an extensive area between test stands 2 and 3. This activity was in a very early stage. It cannot, therefore, be determined whether this program involves the construction of a new test stand or the expansion of support facilities for existing test stands.

34. (TSR) No direct evidence of engine testing (such as new blast marks) was observed at the central test area during the reporting period. The entire facility remained highly active, however, as evidenced by the movement of railcars and equipment and by the construction of new buildings.

Nizhnyaya Salda Rocket Engine Test Facility

35. (TSR) The large, new static test facility that was nearly complete at Nizhnyaya Salda RETF has been identified as a cryogenic hydrogen/-oxygen RETF that may have the capability of testing engines using hydrogen slush fuel. The test stand probably has the capacty to test large space booster engines in the Saturn/TT-05 size class. The Soviets are known to be involved in the development of a large SLV using a hydrogen slush propulsion system in at least one of its stages.[7] Nizhnyaya Salda RETF may be the primary developmental test facility for that system.

36. (TSR) The new space-related static test facility (Figure 12) contains six main areas—a large, vertical rocket engine test stand; a cryogenic hydrogen receiving, conditioning, and storage area; a cryogenic oxygen receiving and storage area; a probable nitrogen storage area; an assembly/-checkout area; and a developmental control/evaluation center. The facility was in a very late stage of construction and is expected to be operational in 1981.

37. (TSR) The vertical test stand is almost externally complete. Some additional work is expected on the uprange side of the building, the uprange service apron, and the downrange blast apron. A bunkered control building, a water reservoir for an exhaust deluge system, at least one of two probable waste propellant dump/recovery buildings, and all propellant supply lines are complete.

38. (TSR) The cryogenic hydrogen receiving, conditioning, and storage area (Figure 13) is nearly complete and probably operational. The area contains the following facilities: a liquid hydrogen offloading point, a cryogenic hydrogen storage facility, four hydrogen flare stacks, a possible hydrogen slush conditioning building, an induced draft cooling tower, a possible hydrogen slush engineering/laboratory building, and a possible fuel pressurization building. The entire area is intraconnected by propellant pipelines.

39. (TSR) For space applications, liquid hydrogen is a very useful, high-energy fuel. The combination of liquid hydrogen and liquid oxygen has the advantage of a very high specific impulse when compared to almost all other potential propellant combinations. The Soviets have failed, however, to use liquid hydrogen in any of their operational space launch systems. A major drawback of liquid hydrogen is its low density (specific gravity of 0.07) requiring bulky tankage. The resulting mass ratio problem is most critical in the first stage, when the greatest volume of propellant is required. The Soviets may be overcoming this problem in their next generation of SLVs through two innovations. The use of hydrogen slush fuel for main engines and the addition of large strap-on, advanced solid-propellant, booster assist motors result in a greatly improved SLV mass ratio compared to an all LH_2/LOX vehicle. There are indications that the Soviets are pursuing both of these alternatives. Hydrogen slush is a heterogeneous fuel in which the temperature of the solution is carefully controlled so that hydrogen molecules exist in both the liquid and solid states. This causes the density of the hydrogen to be increased, resulting in reduced fuel tank size for a given mass of hydrogen. The precise conditioning of hydrogen slush is critical, however. Any deviation outside of strict temperature limits will result in changes in the physical state of the slush that can have catastrophic results. Several unusual components of the cryogenic hydrogen receiving, conditioning, and storage area at Nizhnyaya Salda RETF may be explained by these critical conditioning requirements of hydrogen slush.

40. (TSR) Liquid hydrogen is delivered to the cryogenic hydrogen receiving, conditioning, and storage area by two rail spurs serving the liquid hydrogen offloading point. The liquid hydrogen is then piped

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Table 2.
Construction at the Zagorsk RETF Central Test Area, [redacted]
(Items keyed to Figure 11)

This table in its entirety is classified TOP SECRET RUFF

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Item	Prob Function	Dimensions (m) L	W	H	Floorspace (sq m)	First Seen Ucon	Complete	Comments
1	Garage	48	10	7	480	[redacted]		
2	Support bldg	18	8	7	144			
3	Test support bldg	29	11	19	319			
4	Waste propellant-related bldg	31	10	9	310			Incomplete
5	Waste propellant-related bldg	28	19	10	532			
6	Waste propellant-related bldg	12	12	—	144			Incomplete
7	Two horizontal tanks each	[redacted]	diam	—	(57 cu m)			Vol given for each tank (total, 113 cu m)
8	Waste propellant-related bldg	10	7	3	(70)			Removed by [redacted]
9	Propellant-related bldg	19	12	7	228			
10	Propellant-related bldg	13	12	—	156			Incomplete
11	Propellant stor bldg	29	15	6	435			Incomplete, a cylindrical propellant stor tank, [redacted] being installed in this reconstructed bldg12
	Unid bldg	24	14	6	336			Incomplete
	Total additional floorspace				3,084			

25X1 25X1 25X1 25X1 25X1

into five horizontal cryogen storage tanks, each [redacted] meters long by [redacted] in diameter, at the cryogenic hydrogen storage facility. (These are identical to the tanks described above that are being produced at Kuybyshev 1 and that have also been delivered to the Zagorsk and Omsk RETFs.) The five tanks are protected from solar radiation by an open-sided environmental shed that is designed to maximize the natural ventilation of the site. The shed is completely open on four sides, and the roof is pitched so that any leaking hydrogen gas would quickly escape through a wide opening at the peak, which is in turn covered by a protective sun shield. This design is an effective method to eliminate solar heating of the skin of the tanks while simultaneously preventing a potentially hazardous mixture of hydrogen gas and air from becoming trapped under roof. The storage facility is also protected by lightening arresters and is served by four flare stacks for the safe venting of hydrogen gas. Liquid hydrogen can be piped in a loop from the storage facility, through the possible hydrogen slush conditioning building, and back to the storage facility. The conditioning building is heavily vented, protected by lightning arresters, and served by a two-cell-induced draft cooling tower. By recirculating liquid hydrogen through the conditioning building, its temperature can gradually be reduced until hydrogen slush is formed. Subsequent recirculation is necessary to maintain the proper conditioning of the slush. The cooling tower is a heat exchanger in the conditioning process. The possible hydrogen slush engineering/laboratory building serves to evaluate the characteristics of the slush and to monitor and control the conditioning process. Finally, the possible fuel pressurization building (item 5, Figure 12 and Table 3) provides the force which moves the cryogenic hydrogen throughout the receiving, conditioning, and storage facility and to the vertical test stand. The pressurization building contains 32 high-pressure gas bottles and, when complete, will have at least 32 roof ventilators. It is protected by lightning arresters and is connected to the rest of the receiving, conditioning, and storage area by an overhead pipe gallery. The extensive safety precautions (roof ventilators, lightning arresters, and remote location) and the absence of a separate offloading point for this building might be an indication that hydrogen gas is being used to pressurize the tanks and lines in the receiving, conditioning, and storage area. Several benefits would result from using hydrogen verses more conventional agents (such as helium, nitrogen, or hydrogen peroxide) to pressurize a hydrogen slush system. If high-pressure hydrogen gas is obtained at the pressurization building by boiling liquid hydrogen, its temperature could be kept much lower than that of alternate agents, thereby minimizing any deconditioning effects when in contact with the hydrogen slush. The lower heat capacity of hydrogen gas compared to all other pressurizing agents would also reduce this destablizing influence. In addition, hydrogen gas cannot chemically react with the fuel or reduce its purity and is easily available by bleeding liquid hydrogen from the storage facility.

25X1 25X1

41. (TSR) The identification of liquid hydrogen railcars at the hydrogen offloading point several years before the test stand becomes operational and the early partial operational status of the liquid hydrogen receiving, conditioning, and storage area are further indications that this facility might be involved in a hydrogen slush program. Bringing this part of the facility to an operational status early gives engineers and technicians ample opportunity to develop and modify the critical

25X1

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Table 3.
Construction at the Booster Engine Test Facility of Nizhnyaya Salda RETF
(Items keyed to Figure 12)

This table in its entirety is classified TOP SECRET RUFF

Item	Prob Function	Dimensions (m) L	W	H	Floorspace (sq m)	First Seen Uncon	Complete	Comments
1	Unid bldg	38	13	8	(988)			Incomplete
2	Assem/checkout bldg	—	—	—	—			Incomplete
a	Assem/checkout sect	121	22	12	(2,662)			
b	Shop sect	121	9	7	(1,089)			
c	Shop sect	121	9	7	(1,089)			
d	Shipping/receiving sect	—	—	—	—			
3	Firehouse	32	20	5	640			
4	Civil defense shelter	25	17	—	—			Incomplete
5	Poss fuel pressurization bldg	71	18	7	(1,278)			Incomplete
6	Hydrogen slush conditioning bldg	37	25	9	1,850			
7	Hydrogen slush engr/lab bldg	51	13	5	663			
8	Unid bldg	—	—	—	654			
a	Unid sect	25	20	4	(500)			
b	Support sect	14	11	4	(154)			
9	Waste fuel dump/recovery bldg	12	8	3	96			
10	Waste oxidizer dump/recovery bldg	—	—	—	—			
	Total additional floorspace				2,053			

25X1

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25X1

procedures for the conditioning of hydrogen slush. The actual production and maintenance of slush conditions can be well practiced, and the operational capabilities of the facility can be proven before the beginning of an engine test program.

42. (TSR) The cryogenic oxygen receiving and storage area (Figure 14) is served by rail and contains two 33-meter cryogen storage tanks for liquid oxygen. One of the tanks is under roof. Both are identical to the five tanks at the cryogen hydrogen storage facility. No lightning arresters or flare stacks were in the oxygen area.

43. (TSR) The probable nitrogen storage area (Figure 12) contains facilities for the storage and use of nitrogen both as a cryogen and a high-pressure gas. The probable cryogenic nitrogen storage area contains its own rail-served offloading point, three horizontal probable cryogen storage tanks for liquid nitrogen, an operations building, and a four-cell-induced draft cooling tower. The probable gaseous nitrogen storage area contains 48 high-pressure storage bottles for nitrogen gas and an operations building. It acquires its nitrogen gas from the probable cryogenic nitrogen storage area. Liquid nitrogen will be used for the leakproofing, precooling, and cold flow testing of propellant lines, run tanks, and test articles. Gaseous nitrogen will be used for purging both oxygen and hydrogen lines and tanks and for pressurizing oxygen lines and tanks.

44. (TSR) The assembly/checkout area contains a 121- by 40- by 12-meter, high-bay, assembly/checkout building (item 2); a large administration/engineering building; and a support building. The assembly/checkout building was in a late stage of construction. It will be used for prefire assembly and checkout and for postfire inspection of test articles.

45. (TSR) The developmental control/evaluation center contains a large administration/engineering building that is connected to the test area by underground conduits. This building is the administrative and technical control center for all operations at the new static test facility. A probable civil defense bunker was under construction nearby.

46. (TSR) Although most of the new construction at Nizhnyaya Salda RETF has occurred at the new test facility, a limited amount of construction has also occurred at the older portion of the facility (Figure 15 and Table 4). In addition, a new possible heating plant was under construction at the north end of the new test facility. An overhead pipeline, possibly for steam, was being assembled from the area of construction to the assembly/checkout building and to the pipe gallery leading to the possible fuel pressurization building.

Kurumoch Rocket Engine Test Facility

47. (TSR) Kurumoch RETF has probably been involved in liquid hydrogen engine work for several years. This has been indicated primarily by the regular presence of liquid hydrogen railcars at a propellant offloading/storage area near test stand 4 and on a rail siding outside the entrance to the facility. A propellant supply line links the liquid hydrogen storage area to test stands 4 and 5.

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[redacted] 25X1

The installation of two-toned cryogenic propellant-run tanks at test stands 1 and 4/5 may also be an indication of liquid hydrogen engine testing. It is not clear, however, that liquid hydrogen is being run from these tanks. They may be liquid oxygen run tanks.

48. (TSR) Recent events at test stand 4 indicated that Kurumoch RETF is definitely about to expand or begin a new, liquid hydrogen engine test program. A liquid hydrogen run tank, [redacted] long by [redacted] in diameter, has been installed adjacent to test stand 4. This tank (Figure 16) is a converted liquid hydrogen railcar that was moved from the rail line to the test stand between [redacted] The new propellant storage and supply system was probably complete and operational by [redacted] when propellant supply lines for the new tank were first observed in place.

49. (TSR) This new or expanded test program expected at test stand 4 and/or 5 will probably be for an upper-stage SLV using liquid oxygen as well as liquid hydrogen. It is not known whether the program will be development- or production-related or how closely it may be related to liquid hydrogen engine development at Zagorsk RETF.

50. (TSR) The jet engine test facility at Kurumoch RETF was being expanded to include two additional test cells (Figure 17). The testing of jet engines has never been confirmed at this facility and its function is in doubt. One intelligence study suggests that the Kurumoch RETF Jet Engine Test Facility is actually a hydrogen production plant. This hypothesis has not been conclusively demonstrated, but if it is a hydrogen producer, then its expansion could be intended to support the new or expanded liquid hydrogen engine test program at stands 4/5.

51. (TSR) A significant new construction program is underway in the northwest corner of the facility near the possible acoustical test area. This construction is in a very early stage, as the first earth grading began between [redacted] An examination of grading and footings on imagery of [redacted] indicates that at least three buildings or structures will be erected. It is too early to determine whether this construction is for a new test site or for expansion of the facility's test support capacity. This activity and all other significant construction at Kurumoch RETF since 1974 are detailed in Figure 18 and Table 5. The most important items are the construction of a liquid hydrogen storage area, the installation of a liquid hydrogen run tank (item 1), the expansion of the jet engine test building (item 14), and the expansion of an assembly/checkout building (item 6).

52. (TSR) The series production acceptance testing of rocket engines for operational Soviet SLVs continues at a high rate at Kurumoch RETF. This activity is occurring at test stand 1 and both positions of test stand 3. The high level of test activity, the presence of cryogen run tanks (probably for liquid oxygen), and the capability to test at sea level or altitude conditions indicates that test stand 1 is probably acceptance testing the main engines for the SS-6 based SLV systems (SL-3, -4, and -6). Test stand 1 probably has the capability of testing SS-6 engines either individually or in clusters of four; test stand 3 has been very active also. Large blast marks, similar in size to those at test stand 1, have been observed at the west position, while much smaller blast marks have been seen at the east position. The darkest residues deposited at Kurumoch RETF are found on the blast apron at the east position of test stand 3.

53. (TSR) A highly active engine test program has also been conducted at the possible acoustical test area. Numerous tests have occurred in an easterly direction using the large exhaust diffuser. The facility has the capability of testing engines in a westerly direction using a smaller exhaust diffuser, but there is no evidence that this capability has ever been used. Little is known about the test program at the possible acoustical test area, and no test articles have been identified.

54. (TSR) Kurumoch propulsion test activity during the past three winters, as evidenced from [redacted] is summarized in Table 6. Because of the high level of test activity and the permanent staining of some of the blast aprons by exhaust residue, test activity is difficult to confirm except during the colder months when the ground is covered with snow. Given the frequency of imaged snow cover (about once per winter month), the number of tests (21) identified at test stand 1, dual test stand 3, and the possible acoustical test area is significant. It can be concluded that the level of activity at these test stands has been uniformly high for the past several years. The lack of test evidence or other signs of activity around test stand 2 indicates that it might not currently be involved in a test program. The absence of blast marks at test stands 4 and 5 can be explained by the fact that one or both of these positions are probably being prepared for a new test program.

55. (TSR) Rocket engine nozzles of two different sizes have been identified at Kurumoch RETF (Figure 19). The larger nozzle is [redacted] in diameter at its base by [redacted] high. The smaller nozzle is [redacted] in diameter by [redacted] high. Between [redacted] 44 of the engine nozzles (36 large and 8 small) were placed in a storage yard adjacent to the assembly/-checkout building associated with test stand 2. The nozzles were probably expended from earlier tests and stored inside one of the Kurumoch buildings until the space was needed for another purpose, whereupon they were removed to the open storage yard. The number of nozzles observed there has not changed since 1977. Similar nozzles or engines were observed in a gondola railcar, apparently about to leave the RETF, on imagery of [redacted]

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Moskva Missile and Space Propulsion Development Center Khimki 456

56. (TSR) The large, new, high toxicity exhaust gas scrubber (Figure 20) at Moskva Khimki 456 was nearly complete. The scrubber has been connected to test stand 1 and may become operational in 1980. By [redacted] the scrubber was complete except for the assembly of a second ex- 25X1

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25X1

Table 5.
Construction at Kurumoch Rocket Engine Test Facility,
(Items keyed to Figure 18)

25X1

This table in its entirety is classified TOP SECRET RUFF

25X1

Item	Prob Function	Dimensions (m) L	W	H	Floorsace (sq m)	First Seen Ucon	Complete	Comments
1	Propellant run tank							Vol
2	Propellant run tank							Vol, complete when first observed
3	Propellant stor bldg							Incomplete, abandoned
4	Tank farm (8 tanks)							Total vol of 8 tanks
5	Propellant stor tanks							Vol
a	Tank							
b	Tank							
c	Tank							
d	Tank							
e	Tank							
6	Addition to assem/checkout bldg							
7	High-pressure gas stor bldg							Incomplete
8	Maint bldg							
9	Propellant stor tanks							Vol
a								
b								
10	Admin/engr bldg							3 stories
11	Garage							Incomplete
12	Vehicle maint bldg							
a	Vehicle maint sect							
b	Annex							
13	Unid bldg							
14	Addition to jet engine test bldg							Incomplete
a	Assem/checkout sect							
b	Test sect							
c	Test support sect							
d	Test sect							
15	Pumphouse							
a	Pumphouse							
b	Annex							
16	Propellant run tanks							
a	Control							
b	Tank							Vol
c	Tank							Vol
d	Tank							Vol
e	Tank							Vol
17	Unid bldg							
18	Assem/checkout bldg							
a	Shop sect							
b	Assem/checkout sect							2 stories
c	Admin/engr sect							2 stories
	Total additional floorspace							

25X1

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Table 6.
Evidence of Rocket Engine Testing at Kurumoch RETF
This table in its entirety is classified TOP SECRET RUFF

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Winter Imagery	Test Stand 1	Test Stand 2	Test Stand 3 West	Test Stand 3 East	Test Stand 4	Test Stand 5	Poss Acoustical Test Area
	Poss	—	—	—	—	—	Not operational
	—	—	—	Test	—	—	Test
	Test	—	Test	Unid	—	—	—
	Test	—	—	—	—	—	—
	—	—	—	—	—	—	Poss
	Test	—	Test	Test	—	—	—
	—	—	—	—	—	—	—
	Test	—	Test	Test	—	—	Test
	—	—	—	Test	—	—	—
	—	—	Test	Test	—	—	Test
	Test	—	Unid	Unid	—	—	Unid
	—	—	Test	—	—	—	—
	Test	—	Unid	—	—	—	—
	Unid	—	Unid	Test	—	—	Test
Minimum number of tests occurring during 3 winters:							
1977–78	2	0	1	1	0	0	1
78–79	2	0	2	2	0	0	1
79–80	2	0	2	3	0	0	2
Total	6	0	5	6	0	0	4

Key:

Test—Presence of blast mark indicates test since last date shown
Poss—Possible test evidence
Unid—Due to an earlier blast mark, current status cannot be determined

haust diffuser that will connect it to test stand 2. Components of the second diffuser were on an apron just west of the new scrubber (Figure 21). The new scrubber may attain an operational capability before the second diffuser is attached. On a small amount of steam was emanating from a section of the test stand 1 diffuser, indicating that a nonpropulsion test of the system was being conducted (Figure 20). The steam may have been escaping through a relief valve or leak in the system.

25X1

57. (TSR) The installation of a diffuser between test stand 2 and the new scrubber will require the disconnection of the old scrubber which is still attached to test stand 2. Although the eventual assembly of the second new diffuser is expected,

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Table 7.
Construction at the Moskva Missile and Space Propulsion Development Center Khimki 456 Test Area, (Items keyed to Figure 22)

25X1

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Item	Prob Function	Dimensions (m) L	W	H	Floorspace (sq m)	First Seen Ucon	Complete	Comments
1	Cooling tower							Induced draft, 3 cell
2	Gas holder							
a	Tank							Vol
b	Pumphouse							
3	Control bldg							Irreg shape
4	High-pressure gas stor							Not under roof
5	High-pressure gas stor							Not under roof
6	Stor bldg							
7	Stor bldg							
8	Unid bldg							Incomplete
9	Cooling tower							Induced draft, 3 cell, reconstructed
10	Cooling tower							Induced draft, 2 cell, reconstructed
11	Cooling tower							Induced draft, 2 cell
12	Exhaust gas scrubber bldg							
a	Exhaust stack							
b	Scrubber sect							Height above ground, 100m
13	Test sect							Incomplete, reconstructed
14	Test support bldg							
a	High-bay sect							
b	Low-bay sect							
15	Test support bldg							
a	Test support sect							Incomplete
b	Test support sect							
16	Test support bldg							Incomplete
17	Test support bldg							Incomplete
	Total additional floorspace							

[redacted]

25X1

Table 8.
Construction at the Moskva Missile and Space Propulsion Development Center Khimki 456 [redacted] Items keyed to Figure 23)

This table in its entirety is classified TOP SECRET RUFF

25X1

Item	Prob Function	Dimensions (m) L	W	H	Floorspace (sq m)	First Seen Ucon	Complete	Comments
1	Excavation	95	24	—	—			
2	Unid bldg	48	13	4	(624)			
3	Admin/engr bldg	52	19	—	(988)			Incomplete
4	Cooling tower	43	10	10	—	[redacted]		Induced draft, 2 cell
5	Fab/assem bldg	—	—	—	—			
a	Fab/assem sect	63	59	14	3,717			
b	Fab/assem sect	61	19	17	1,159			
c	Admin/engr sect	78	28	13	3,101			Irreg shape
d	Shipping/receiving sect	59	—	—	—			
e	Assem/test sect	18	18	14	324			
f	Assem/test sect	18	18	19	324			
g	Shop sect	63	17	11	1,071			
6	Fab/assem bldg	140	79	15	5,714			Irreg shape
7	Support bldg	17	12	6	204			
8	Support bldg	19	17	4	204			Irreg shape
	Total additional floorspace				15,818			

25X1

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RCA-09/0010/80

[redacted]

there are indications that this assembly may be delayed. The Soviets apparently have a need to maintain the short-term operational status of the old scrubber. When the original exhaust diffuser between test stand 1 and the old scrubber was dismantled, the old scrubber was rendered temporarily nonoperational. Disturbed sections of the old scrubber were rebuilt, however, and on [redacted] a large quantity of steam was observed exhausting from the vertical stack (Figure 20). A propulsion test was probably not in progress, but steam accumulators at test stand 2 and/or the scrubbing device itself were being operated either in preparation for a test or to checkout the test stand/diffuser/exhaust scrubber system. Smaller amounts of steam are regularly seen exhausting from the stack of the old scrubber.

58. (TSR) Major modification and expansion of test stand 1 will probably delay operational use of the new scrubber until 1981. This may be the reason that the old scrubber has been returned to an operational status. The downrange section of test stand 1 is being reconstructed and enlarged (item 13, Figure 22 and Table 7). Additional structures under construction or recently completed in the vicinity of the new scrubber include four test support buildings, a new two-cell-induced draft cooling tower, and two reconstructed cooling towers.

59. (TSR) A major expansion of the Center's capability to use cryogenic propellants is underway. A large, new, cryogenic propellant-storage facility has been completed. It contains a control building and 25 vertical, two-toned cryogenic storage tanks (each [redacted] in diameter) identical to those installed at Kurumoch RETF. This was preceded by a major expansion of the air separation and liquefaction plant during the previous reporting period.[9] A new three-cell-induced draft cooling tower (item 1) has been constructed northeast of the separation/liquefaction plant. It was probably intended to replace or supplement a large, old natural draft cooling tower nearby. This upgraded capability to use cryogenic propellants is probably related to the construction of new toxic exhaust gas treatment facilities and the modification of test stand 1 and indicates the Soviet's increased interest in developing a highly toxic, high-energy, cryogenic propulsion system for space launch vehicle use.

60. (TSR) The center's high-pressure gas storage capacity is also being expanded. A bank of 35 high-pressure gas bottles (items 4 and 5) was being installed at the test area. Each bottle is [redacted]

61. (TSR) Building construction at the Moskva Khimki 456 Plant area is probably intended to support new rocket engine test programs that may be underway at the test area by 1981 or 1982. The main structures constructed during the current reporting period are two fabrication/assembly buildings (items 5 and 6, Figure 23 and Table 8).

Faustovo Aerospace Research and Development Facility and Test Range/Track

62. (TSR) The Faustovo Aerospace Research and Development Complex is involved in the developmental testing of a wide range of aerospace hardware, probably including liquid- and solid-propellant propulsion components and systems for SLVs, spacecraft, ICBMs, surface-to-surface (SSM) cruise missiles, air-to-air and surface-to-air missiles, and aircraft. Nonpropulsion components for many of the same systems are also probably tested there. The complex includes a missile propulsion test area, a rocket motor checkout and probable explosives-forming area, a solid-propellant missile storage area, a components test area, a type IIID silo area, an aircraft components test area, an aircraft engine and armaments test area, and a test track area. The Kuznetsovo Engine Test Facility [redacted] an aircraft engine propulsion test facility under construction, is also part of the complex but is not reported here.

25X1 25X1

63. (TSR) While the entire missile propulsion test area appeared active, the only direct evidence of propulsion testing during the reporting period was the identification of a blast mark on the snow-covered blast apron and deflector at solid motor test cell 1 from imagery of [redacted] indicating that a rocket motor test was conducted at that position in early March. Although the probable high toxicity propulsion test building (horizontal test building 3) was complete in 1978 and probably operational soon thereafter, no evidence of propulsion testing has been identified. It should be noted, however, that imagery of the Faustovo Complex has been acquired infrequently. Only a small amount of construction was in progress at the complex during the reporting period. The most significant new construction was the installation of footings for a large new building (item 2, Figure 24 and Table 9) in the southeast corner of the missile propulsion test area near the laboratory and compressor buildings associated with the new toxic gas control systems.

25X1 25X1

64. (TSR) No significant changes or new activity was observed at the rocket motor checkout and probable explosives forming or solid-propellant missile storage areas. At the components test area, several previously reported spacecraft mockups and unidentified space-related test articles continued to be observed. SS-11 equipment (including missile transporters, silo loaders, and propellant transporters) continued to be seen at the type IIID silo area. The aircraft engine and components test area and the aircraft armaments test area also remained active, although no direct evidence of propulsion testing was observed. Aircraft parts continued to be seen at both areas.

25X1 25X1

65. (TSR) At the test track area, a rocket test sled has been observed on numerous occasions. The best recent coverage of the test sled occurred on [redacted] (Figure 25), when it was near the gantry crane serving the uprange end of the test track. The rocket sled resembles a section of an aircraft and consists of a fuselage, [redacted] by about [redacted] meters in diameter (aft of the wing), and includes an aerodynamic nose, probable canopy, and short stabilizing wings. The wings have a span of [redacted] and a root length of about [redacted] The location of the rocket sled on [redacted] and on other occasions indicates that it has recently been involved in a test program at the 2,500-meter-long high-speed test track. At least two rocket sleds of similar configuration have been observed simultaneously.

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Table 9.
Construction at the Missile Propulsion Test Area of Faustovo Aerospace Research and Development Facility, [redacted] (Items keyed to Figure 24) 25X1

This table in its entirety is classified TOP SECRET RUFF

25X1

Item	Prob Function	Dimensions (m) L	W	H	Floorspace (sq m)	First Seen Ucon	Complete	Comments
1	Admin bldg	25	24	6	(600)	[redacted]		Incomplete
2	Unid bldg	75	29	—	(2,175)			Incomplete
3	Admin/engr bldg	18	12	10	432			2 stories
4	Control/engr bldg	22	18	11	792			2 stories
5	High-pressure gas stor bldg	17	10	6	—			
6	Horizontal test bldg 3	40	10	16	4,152			
a	Admin/engr sect	40	10	16	(1,920)			3 stories
b	Assem/test support sect	93	24	13	(2,232)			Irreg shape
7	Tank	—	[redacted]		(221 cu m)			Vol
	Total additional floorspace				5,376			

25X1

[redacted]

25X1

Table 10.
Construction at Kuybyshev Aerospace Production Plant 1
[redacted] **(Items keyed to Figure 26)** 25X1

This table in its entirety is classified TOP SECRET RUFF

25X1

Item	Prob Function	Dimensions (m) L	W	H	Floorspace (sq m)	First Seen Ucon	Complete	Comments
1	Assem hall	329	40	27	13,160	[redacted]		
2	Admin/engr bldg	36	13	18	(2,340)			Incomplete, 5 stories
3	Assem bldg	56	53	27	(2,968)			Incomplete
4	Addition to jet engine test bldg	—	—	—	2,025			
a	Assem/checkout sect	55	27	19	(1,485)			
b	Shop sect	27	20	19	(540)			
5	Security bldg	25	8	5	200			
6	Foundation	58	31	—	(1,798)			Incomplete
7	Stor bldg	36	13	4	468			
8	Shipping/receiving bldg	132	20	—	(2,640)			Incomplete
9	Cooling tower	25	9	9	—			Induced draft, 3 cell
10	Shipping/receiving bldg	43	7	5	301			
11	Shipping/receiving bldg	—	—	—	(4,643)			Still ucon
a	Shipping/receiving sect	179	25	15	(4,403)			
b	Support sect	24	10	5	(240)			
12	Stor bldg	36	19	12	(684)			Incomplete
13	Stor bldg	95	11	4	1,045			
14	Stor bldg	98	9	—	882			
15	Shop bldg	—	—	—	3,382			
a	Shop sect	37	36	17	1,332			
b	Admin sect	41	10	19	2,050			5 stories
	Total additional floorspace				24,845			

Kuybyshev Aerospace Production Plant 1

66. (TSR) Preparations for the production of a large, new space launch vehicle were underway at Kuybyshev Plant 1. A large, new assembly hall (item 3, Figure 26 and Table 10) was being constructed as an addition to the assembly building that was previously involved in the production of the now abandoned TT-05 heavy-lift vehicle. The enlarged building will probably be the primary production building for the new heavy-lift SLV expected to be launched from the new Tyuratam Launch Site W and the modified Tyuratam Space Launch Site J1/2. The new assembly hall was in an early stage of construction. An estimate of its final size (9,231 square meters) is based upon a recent detailed study of the building's construction.[10] Another expansion of the building was only recently completed. It resulted from the construction of an even larger assembly hall (item 1, 13,160 meters) during 1976 and 1977, that increased the floorspace of the original building by 72 percent. The most recent expansion will add another 51 percent to the original size of the building for a total expansion of 123 percent, prior to the beginning of the new production program. This, combined with the fact that four launch pads are being prepared for the new launch vehicle, indicates Soviet confidence in the design of the new heavy-lift vehicle and also their plans for a fairly high launch rate once the new SLV is operational.

67. (TSR) Production activity at Kuybyshev Plant 1 remained at a very high level. Table 11 enumerates several important indicators (33-meter cryogen tanks, SSN-3/-12 crates, and missile component railcars) of that activity for the period covered by this report. In addition, large quantities of specialized shipping containers, crates, drop-center railcars, and production-associated equipment and materials have been observed. The continued expansion of transshipment facilities (shipping/receiving buildings and rail spurs) in the northern corner of the plant also reflects this high level of activity.

68. (TSR) The production of a large, cryogenic propellant-storage tank [redacted] long by 25X1
[redacted] in diameter) has been increased at Kuybyshev Plant 1 (Figure 27). Previously, ten of the tanks had been produced at the plant and were shipped to Nizhnyaya Salda RETF (seven tanks), to the Zagorsk RETF possible liquid hydrogen production plant (one tank), and to Omsk RETF (two tanks). The tanks can be used for the storage of either liquid hydrogen or liquid oxygen, and probably other cryogens as well. Since [redacted] seven additional tanks have been produced at Kuybyshev Plant 1 at a rate of about one per month. These tanks and one additional tank could be expected to be shipped to the Zagorsk RETF possible liquid hydrogen production plant during the spring or summer of 1980. The eighth tank could be produced, and all eight tanks could be ready for shipment from Kuybyshev Plant 1 by mid-April 1980. 25X1 25X1

69. (TSR) The continued presence of SSN-3/-12 crates (Figure 27) at Plant 1 is not clearly understood but might be an indication of a program to upgrade the SSN-12 missile. Varying quantities (one to 12) of the crates were observed at the plant during the current reporting period, indicating significant probable SSN-12-related activity. The usual location of the crates was adjacent to the jet engine test building, suggesting that SSN-12 sustainer engines were being tested there.

25X1

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Table 11.
Cryogen Tanks, SSN-3/-12 Crates, and Missile Component Railcars at Kuybyshev Aerospace Production Plant 1

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Date	33-Meter Cryogen Tanks	SSN-3/-12 Crates	Missile Component Railcars
	—	1	32
	—	1	31
	—	5	42
	—	9	34
	—	1	42
	—	1	42
	—	1	27
	—	1	29
	—	1	17
	—	1	38
	1	4	17
	1	3	18
	1	7	20
	1	4	40
	1	8	46
	1	3	39
	2	9	37
	2	11	37
	2	8	33
	3	6	40
	4	8	37
	4	9	29
	5	12	32
	6	11	22
	6	11	25
	6	11	18
	6	11	17
	7	11	36

Table 12.
Product-Related Railcars at Moskva Missile Production Plant Fili 23

This table in its entirety is classified TOP SECRET RUFF

Date	Loaded SL-12/-13 Cradle Railcars	Empty SL-12/-13 Cradle Railcars	Missile Component Railcars
	—	3	21
	—	2	20
	—	3	18
	2	4	24
	—	3	25
	—	1	27
	—	1	17
	—	4	28
	—	Und	35*
	—	2	8
	—	Und	11
	—	—	20

*Approx count

**Partial coverage

Und—undetermined

25X1

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25X1

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70. (TSR) The numbers and variation in numbers of missile component railcars seen at the plant are a good measure of the general activity level there. Short-term fluctuations, when frequent imagery coverage was available, are particularly revealing. The number of missile component railcars at Kuybyshev Plant 1 varied from a low of 17 to a high of 46 during the current reporting period.

71. (TSR) Spacecraft (or spacecraft component) shipping containers of three different sizes continued to be seen at Kuybyshev Plant 1 (items A, B, and C, Figure 27). Item A is an elliptical container, [redacted] Item B is cylinder shaped, [redacted] in diameter by [redacted] high. Item C, also cylindrical, is [redacted] in diameter by [redacted] high. Numerous examples of each were seen in storage and on railcars near the jet engine test building during the reporting period. Each of the containers appears to have a bevelled upper edge around its circumference. The probable spacecraft-related containers are similar in appearance and size to containers observed at several other space-related installations, including Moskva Plant Fili 23, Dodonovo Missiles and Space Components Plant, Moskva Khimki 301, Moskva Kaliningrad 88, and Tyuratam Space Launch Sites B1 and B2 (BE [redacted]

72. (TSR) A variety of unidentified product crates continue to be observed at the plant. Many of these crates have hexagon- or wedge-shaped cross sections. Lengths for the hexagonal crates are [redacted] and [redacted] and for the wedge-shaped crates, [redacted]

73. (TSR) The construction of new transshipment facilities (shipping/receiving building 2, rail spurs and sidings, transshipment aprons, and gantry cranes) in the northern corner of the plant has increased the railcar handling capacity of Plant 1. It has also provided space in the old eastern transshipment facility for the assembly and storage of the 33-meter cryogenic propellant-storage tanks and the expansion of production building floorspace. With little room to expand its boundaries, Kuybyshev Plant 1 is rapidly exhausting economical methods of growth. The alternative is the rearrangement of plant layout by removing older buildings and facilities that are inefficient users of space and by relocating rail lines and transshipment facilities to create space for new building construction. Figure 26 and Table 8 show plant construction during the reporting period.

Moskva Missile Production Plant Fili 23

74. (TSR) The production capacity for SL-12/-13 missiles has been increased significantly. This has been accomplished by the recent relocation of SL-12/-13 production within Moskva Plant Fili 23. SL-12/-13 production was apparently transferred to a much larger building with 47,600 square meters of production floorspace in 1978. The new SL-12/-13 fabrication/assembly building (Figure 28) was externally complete late in 1975. Internal construction probably continued throughout 1976 with tooling up for production occurring in 1977. By September 1977, handling rings, fabrication jigs, and component dollies were beginning to appear on newly prepared service aprons around the building. And in February 1978, the first missile component railcars were seen on the rail spur serving the new building. SL-12/-13 cradle cars continued to be observed at the old SL-12/-13 assembly building as late as April 1978.

75. (TSR) The evidence that indicates the new fabrication/assembly building is producing the SL-12/-13 is increasingly strong. The component dollies/handling carts (Figure 29) that have been seen around the new building are believed to be associated with SL-12/-13 production and were previously observed on service aprons closer to the old SL-12/-13 production building. Some of the handling rings/fabrication jigs (Figure 30) that have been observed near the new building are large enough to be compatible with the SL-12/-13 airframe and were also once associated with the SL-12/-13 building. The beginning of production-related activity at the new building corresponded to a decline in activity (especially rail traffic) at the old building.

76. (TSR) On imagery of [redacted] a suspect SL-12/-13 airframe section was identified in a storage area adjacent to the new building (Figure 31). The object is about [redacted] in diameter (the SL-12/-13 airframe is [redacted] in diameter) and [redacted] long. It is very similar (except in length) to a possible SLV airframe section ([redacted] in diameter by [redacted] long) identified at the plant on imagery of [redacted] Both of the objects appeared to be polygonal, rather than circular, in cross section, however, and may be fabrication jigs or part of the tooling for the SL-12/-13, rather than actual airframe sections.

77. (TSR) The best evidence of SL-12/-13 production at the new fabrication/assembly building was the identification of two SL-12/-13 cradle railcars outside the main rail entrance to the building on imagery of [redacted] (Figure 32). They were parked on the rail line that exclusively serves the new SL-12/-13 fabrication/assembly building.

78. (TSR) A high level of activity continued throughout the reporting period at Moskva Plant Fili 23. This activity is demonstrated by the large amount of product-related rail traffic described in Table 12 and by the continuing plant construction shown on Figure 28 and described in Table 13. Both the large number and movement of missile component railcars indicates a high rate of product transshipment. Most SL-12/-13 cradle railcars were observed unloaded. This probably reflects the fact that SL-12/-13 trains leave the plant as soon as all major subassemblies have been loaded onto missile component and cradle railcars. Returning, empty trains may be delayed at the plant, however, while the assembly of components for the next missile is being completed.

79. (TSR) New fabrication/assembly and administration/engineering sections (items 2a and b, Figure 28 and Table 13) have been added to the SL-12/-13 production building. Rail service to the building has also been improved by the addition of a second spur, this one entering the new fabrication/assembly section. Another large, high-bay fabrication/assembly building (item 5) was under construction in the central plant area. It was in a late stage of construction and will contain 7,200 square meters of production floorspace. Construction of the new probable vertical assembly/hydrostatic test building (item 17) in the design bureau area

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Table 14.
Construction at the Scientific Research Institute 88 of Moskva Missile and Space Development Center Kaliningrad 88, [redacted] 25X1
[redacted] **(Items keyed to Figure 33)** 25X1

This table in its entirety is classified TOP SECRET RUFF

Item	Prob Function	Dimensions (m) L	W	H	Floorspace (sq m)	Comments
1	Support bldg	21	6	8	126	
2	Parking apron	44	32	—	—	Occupied by propellant transporters
3	Security bldg	13	10	5	130	
4	Support bldg	24	7	3	168	
5	Stor bldg	20	7	5	140	
6	Stor bldg	34	8	5	272	
7	Stor bldg	34	8	5	272	
8	Stor bldg	30	16	7	(430)	Incomplete
9	Stor bldg	43	13	4	559	
10	Excavation	41	15	—	—	Incomplete
11	Unid bldg	44	37	14	(1,628)	Incomplete
12	Unid bldg	143	78	—	(11,154)	Incomplete
13	Unid bldg	—	—	—	(1,750)	
a	Unid sect	36	18	13	(648)	Incomplete
b	Unid sect	49	10	15	(490)	Incomplete
c	Unid sect	36	17	11	(612)	Incomplete
14	Excavation	119	35	—	(4,165)	Incomplete
15	Excavation	93	27	—	(2,511)	Incomplete
16	Footings	40	28	—	(1,120)	Incomplete
17	Lab bldg	38	12	6	456	
18	Control bldg	18	10	7	180	For high-pressure gas
19	Assem/test bldg	—	—	—	23,358	
a	Assem/test sect	257	30	31	(7,710)	
b	Admin/engr sect	257	12	21	(15,420)	5 stories
c	Support sect	19	12	14	(228)	
20	Cooling towers	82	12	12	—	Induced draft; 5 cell
21	Assem/test bldg	—	—	—	(12,056)	Incomplete
a	Assem/test sect	138	48	30	(6,624)	
b	Admin/engr sect	138	12	18	(6,624)	4 stories; incomplete
c	Admin/engr sect	138	12	18	(6,624)	4 stories
22	Lab bldg	67	19	10	1,273	
23	High-pressure gas stor bldg	—	—	—	—	76 high-pressure gas bottles; incomplete
24	Assem/test bldg	—	—	—	9,594	
a	Assem/test sect	123	36	19	(4,428)	
b	Admin/engr sect	123	14	16	(5,166)	3 stories
25	Shop bldg	31	25	6	775	
26	Admin/engr bldg	—	—	—	35,466	
a	Admin/engr sect	132	23	29	(18,216)	6 stories
b	Admin/engr sect	128	23	30	(17,664)	6 stories
	Total additional floorspace				86,017	

has been completed. Construction was also observed on two shop buildings and several minor structures.

80. (TSR) Two small shipping containers have been observed in association with the new SL-12/-13 production building (Figure 30). They have a base diameter of [redacted] a top diameter of [redacted] meters, and a height of [redacted] Their unusual configuration is similar to that of numerous shipping containers observed at several other space-related production facilities.

Moskva Missile and Space Development Center Kaliningrad 88

81. (TSR) Moskva Missile and Space Development Center Kaliningrad 88 consists of four interrelated installations: Scientific Research Institute 88, the Central Design Bureau for Space and Intercontinental Rockets, Missile Plant 88, and the Rocket Motor Test Area. Extensive construction programs during the past several years are significantly increasing the Center's capacity to develop and/or produce a variety of space-related systems, including new launch vehicles, propulsion systems, and spacecraft. 25X1

82. (TSR) At scientific research institute 88 (Figure 33 and Table 14), two major complexes of buildings have been under construction. The first was begun in 1972 and is almost complete. The second was in an early stage of construction. 25X1

83. (TSR) The primary function of the first complex is probably research and developmental testing of new concepts and hardware. The main features of the probable test complex are two high-bay probable test buildings connected to four large exhaust stacks; three high-bay probable assembly/test buildings; a test support building with 13 possible electrical transformers; at least 72 vertical,

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25X1

Table 15.
Construction at the Central Design Bureau for Space and Intercontinental Rockets of Moskva Missile and Space Development Center Kaliningrad 88 (Items keyed to Figure 34)

25X1

This table in its entirety is classified TOP SECRET RUFF

Item	Prob Function	Dimensions (m) L	W	H	Floorspace (sq m)	Comments
1	Admin/engr bldg addition	134	15	13	—	Incomplete
2	Admin/engr bldg	105	19	26	(7,980)	4 stories; incomplete
3	Unid bldg	49	12	6	(558)	Incomplete

high-pressure gas storage bottles; and two banks of induced draft cooling towers. The absence of rail service, the presence of high-pressure gas storage bottles, and the complexes' location at the Scientific Research Institute indicate that the production of hardware will not be a major function of the probable test complex. Test article assembly and checkout will probably occur within some of the buildings, and a prototype production capability cannot be ruled out.

84. (TSR) The function of the second complex cannot be determined at its early stage of construction. Four buildings were under construction and there were excavations for two more. Additional expansion at the scientific research institute includes the construction of a propellant vehicle parking apron, a large administration/engineering building, and numerous support buildings.

85. (TSR) At the central design bureau for space and intercontinental rockets (Figure 34 and Table 15), a significant expansion of building floorspace was underway. This expansion includes the construction of an unidentified building (item 3), an administration/engineering building (item 2), and an administration/engineering addition (item 1) to the large assembly building. This construction program will greatly increase the central design bureau's capacity to design and produce both manned and unmanned spacecraft.

86. (TSR) Numerous probable spacecraft (or spacecraft component) shipping containers continue to be observed at the Central Design Bureau (Figure 35). The containers are probably part of a whole family of containers used to ship a variety of spacecraft and/or spacecraft components. They are similar to containers seen at several other space-

Table 16.
Construction at the Missile Plant 88 of Moskva Missile and Space Development Center Kaliningrad 88, [redacted]
(Items keyed to Figure 36)

25X1

This table in its entirety is classified TOP SECRET RUFF

Item	Prob Function	Dimensions (m) L	W	H	Floorspace (sq m)	Comments
1	Fab/assem bldg	120	60	35	(7,200)	Incomplete
2	Admin bldg	26	13	6	338	
3	Shop bldg	41	22	28	902	
4	Shop bldg	110	28	9	(3,080)	Incomplete
5	Unid bldg	125	30	—	—	Incomplete
6	Shop bldg	54	19	12	(1,026)	Incomplete
	Total additional floorspace				1,240	

Table 17.
Construction at the Rocket Motor Test Area of Moskva Missile and Space Development Center Kaliningrad 88, [redacted]
(Items keyed to Figure 37)

25X1

This table in its entirety is classified TOP SECRET RUFF

Item	Prob Function	Dimensions (m) L	W	H	Floorspace (sq m)	Comments
1	Support bldg	12	5	5	60	
2	Unid bldg	14	4	10	(56)	Incomplete
3	Support bldg	44	13	—	572	
4	Unid bldg	24	19	—	(456)	Incomplete
5	Support bldg	16	6	4	96	
6	Stor bldg	70	24	8	1,592	Irreg shape
7	Lab bldg	25	22	14	550	
	Total additional floorspace				2,870	

related installations, including Moskva Khimki 301, Dodonovo Missiles and Space Components Plant, Kuybyshev Plant 1, Moskva Plant Fili 23, and Tyuratam Space Launch Sites B1 and B2.

87. (TSR) At missile Plant 88, a fabrication/assembly building (item 1, Figure 36 and Table 16) is being expanded, and several additional structures are under construction. A moderate amount of construction has also been observed at the rocket motor test area (Figure 37 and Table 17).

Moskva Guided Missile Research and Development Plant Khimki 301

88. (TSR) A major facility expansion is continuing at Moskva Guided Missile Research and Development Plant Khimki 301. This expansion will greatly improve the plant's capability to develop, and increase its capacity to produce, unmanned spacecraft. The major expansion program is occurring in the main plant area (Figure 38 and Table 18) and includes the construction of a probable centrifuge, an associated engineering/assembly/checkout building, a final assembly addition to the main assembly building of the plant, a fabrication/assembly and shipping/receiving additions, two shop buildings, two administration/engineering buildings, and several support buildings.

89. (TSR) The probable centrifuge (item 8) is in a midstage of construction. The associated engineering/assembly/checkout building (item 9) is being constructed adjacent to the probable centrifuge so that the assembly/checkout section will be in a position to directly serve the probable centrifuge. The assembly/checkout section was in an early stage of construction, whereas the engineering section was in a late stage of construction. The final assembly addition (item 7) to the main assembly building is complete. The fabrication/assembly and shipping/receiving buildings (items 2 and 3) were in a late stage of construction. The shop building and two administration/engineering buildings were completed during the previous reporting period.

90. (TSR) Numerous probable spacecraft (or spacecraft component) shipping containers and crates (Figure 39) continue to be observed at the plant. Some of these items belong to the family of probable spacecraft-related shipping containers that have been seen at a number of space-related installations enumerated elsewhere in this report. Numerous handling rings up to [redacted] in diameter were also seen in the main plant area. A high volume of rail traffic—including 24-meter missile component railcars, missile propellant railcars, and general-purpose railcars—was also observed during the reporting period.

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Table 18.
Construction at the Main Plant Area of Moskva Guided Missile Research and Development Plant Khimki 301 (Items keyed to Figure 38)

This table in its entirety is classified TOP SECRET RUFF

Item	Prob Function	Dimensions (m) L	W	H	Floorspace (sq m)	First Seen Ucon	Complete	Comments
1	Fab/assem bldg	—	—	—	5,784			Incomplete
a	Fab/assem sect	108	32	32	(3,456)			
b	Shop sect	97	12	10	(2,328)			
2	Fab/assem bldg	92	19	11	(1,748)			Incomplete
3	Shipping/receiving bldg	62	19	16	(1,302)			Incomplete
4	Shop bldg	31	19	10	589			
5	Shop bldg	36	24	16	(864)			Incomplete
6								
7	Final assem addition	89	37	23	3,293			
8	Centrifuge	—	26 diam	—	(531)			Incomplete
9	Engr/assem/checkout bldg	—	—	—	(2,659)			Incomplete
a	Assem/checkout sect	49	35	18	(1,715)			
b	Engr sect	54	12	17	(1,944)			
10	Support bldg	10	10	8	100			
	Total additional floorspace				9,766			

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Table 19.
Construction at Zagorsk Missile and Space Development Center
[redacted] **(Items keyed to Figure 41)** 25X1
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Item	Prob Function	Dimensions (m) L	W	H	Floorspace (sq m)	First Seen Uncon	Complete	Comments
1	Assem/shop bldg	—	—	—	1,793	[redacted]		
a	Assem sect	49	25	25	(1,225)			
b	Shop sect	49	10	15	(490)			
c	Support sect	13	6	4	(78)			
2	Maint bldg	34	7	4	238			
3	Tank	—	[redacted] diam		(107 cu m)			
4	Support bldg	31	8	3	240			Complete when first observed
5	Garage	48	19	5	912			Complete when first observed
6	Tank farm	—	—	—	(279 cu m)			10 tanks; total vol shown
7	Shop bldg	61	25	10	1,525			
8	Unid bldg	13	13	5	152			Irreg shape
9	Unid bldg	24	7	5	168			
10	Foundation	30	15	—	(450)			Incomplete
	Total additional floorspace				5,028			

25X1

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91. (TSR) In the test area, a conical object, possibly a payload shroud (Figure 40), has been observed. It is [redacted] and [redacted] in diameter. Although the movement of inplant propellant transporters has been observed at the test area and test stand 1 appeared to be active, no specific propulsion tests have been identified.

Zagorsk Missile and Space Development Center

92. (TSR) A new suspect developmental test facility was in a very early stage of construction at Zagorsk Missile and Space Development Center (Figure 41). The new suspect test facility is being constructed near the former site of the structural/dynamic test area, which has been dismantled and regraded. Dismantlement of the structural test tower was accomplished in 1975 and was followed by the removal of the test area's separate security fence, the destruction of the concrete apron, and regrading of the site. Subsequently, a small structure was constructed, and a trench has been dug in the area.

93. (TSR) The new suspect developmental test facility is under construction just west of this site in a formerly wooded section of the Zagorsk Development Center. An irregular-shaped area of tree clearing and earth grading for the new suspect test facility covered an area about 140 meters in diameter. A small structure has been set up at the center of the area, and a building, [redacted] has been constructed at the west end of the area. No apron paving or additional construction has been noted. The suspect test facility was in too early a stage of construction to identify its specific function.

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94. (TSR) New construction was underway just southwest of the modified J minipad. A foundation, 30 by 15 meters, was under construction there. This building may be related to the J minipad. Additional construction at the Zagorsk Development Center is shown on Figure 41 and described in Table 19. Ten horizontal storage tanks have been installed on a loop road near the rail spur in the middle of the Development Center. Propellant transporters and railcars and 24-meter missile component railcars continued to be observed. The domed inflatable building has been disassembled.

REFERENCES

IMAGERY

(TSR) All relevant KEYHOLE imagery acquired through [redacted] the information cutoff date, was used in the preparation of this report. The latest date of imagery used for each installation is presented in the Introduction. 25X1

MAPS OR CHARTS

ACIC. US Air Target Charts; Series 200; Sheets 0154-23, 0156-13, 0165-17, and 0167-5; scale 1:200,000 (UNCLASSIFIED)

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REQUIREMENT

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